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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,050	07/14/2006	Manabu Amikura	3308.2R.337	2437

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WASHINGTON, DC 20036

EXAMINER

FORD, NATHAN K

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

12/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/586,050

Applicant(s)

AMIKURA, MANABU

Examiner

NATHAN K. FORD

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Applicant's Response

Acknowledged is the applicant's request for continued examination received on December 20, 2007. Claims 1 and 6 are amended; claims 13 and 14 are new.

The applicant's arguments address the examiner's delimitation of Kuwada's head mounting frame. Specifically, the remarks contend that elements 84 and 108 cannot both be regarded as components of the head mounting frame since these features are structurally independent and the claims have been amended to recite a mounting frame that is a unitary structure.

The examiner has found this argument persuasive. Accordingly, the previous rejections have been revised but are nevertheless sustained by the same references disclosed priorly. It should be recognized that element 108 alone satisfies the applicant's recitation of a unitary head mounting frame, as detailed below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6, 11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuwada et al., US 2002/0029748.

Claims 6, 14: Kuwada teaches a processing apparatus comprising the following:

- A processing vessel (22);
- A susceptor (28) positioned within the vessel;
- A showerhead with a cup-shaped main body (82), further comprising:
 - A bottom wall (92) provided with a plurality of gas injection holes (94);
 - A side wall (98) extending from a peripheral portion of the bottom wall;
 - Wherein an upper end of the side wall has steps providing a projection (104);
- A unitary head mounting frame (108) arranged at a ceiling portion of the vessel to support the showerhead, further comprising:
 - A through-hole (74) into which the showerhead projection is inserted [0052];
 - Wherein portions (98) of the sidewall other than the projection are not inserted into the through-hole;

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- o Wherein the projection is exposed to an exterior of the processing vessel (Fig. 1);
- A cooling mechanism (112, 116) attached to an upper-end portion of the projection [0054];
- A diffusion chamber forming plate (122) housed in the shower head main body [0058].

Claim 11: The cooling mechanism comprises a Peltier device (112) and a cooling jacket (116) [0054, 0056]. The Peltier device is disposed atop the showerhead projection (Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada.

Claims 1, 13: The rejection of claim 6 substantially addresses those features recited by applicant's claim 1. However, the embodiment relied upon to reject claim 6 does not avail screw bolts to secure the showerhead to the head mounting frame. Nevertheless, Kuwada discloses additional embodiments, such as the configuration delineated by Figure 10, which depict alternative connective methods. The species of Figure 10 employs screw bolts (5, 13) which extend from the bottom of the showerhead (11) through its body (7) and threadably engage the head mounting frame (2a), thereby demonstrating the efficacy of this alternative connective technique. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use screws to achieve the predictable result of attaching and securing a showerhead to a head mounting frame.

Claim 5: The rejection of claim 11 addresses the recitation of this claim.

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada in view of Hytros.

Kuwada teaches neither the hinge fixing of the head-mounting frame (108) to the chamber sidewalls nor the capacity to remove the frame from the wall. Hence, a secondary reference, Hytros, is cited, which limns a showerhead assembly positioned within a process chamber. Further, the ceiling lid (144) is coupled to the chamber walls (106) via a hinge; this hinge permits the lid to be opened, thereby exposing the interior of the chamber body [0028]. As the connecting piece is a hinge, the lid can most certainly be removed from the chamber. Thus, it would

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have been obvious to one of ordinary skill in the art at the time the invention was made to hingedly affix Kuwada's mounting frame to the chamber wall to expose and gain access to the interior of the chamber body.

Claims 3, 8-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada in view of Metzner et al., US 2002/0192370.

Kuwada inserts the showerhead projection into a single through-hole rather than a plurality as claimed. Nevertheless, alternative connective techniques are well-known in the art. Metzner, for instance, elaborates a showerhead having an upper surface (263) from which a plurality of fasteners (242) project to engage a corresponding plurality of through-holes formed in the mounting frame (205) disposed above [0054]. As Figure 6 delineates, the projecting fasteners are circumferentially disposed. The advantages of this configuration include improved heat transfer between the showerhead and mounting frame. Given this disclosure, it would have been obvious to one of ordinary skill in the art to affix the showerhead to the mounting frame at multiple sites to achieve the predictable result of securely fastening the two members.

Claims 9, 12: Element 106a satisfies the description of a ring-shaped flange element arranged adjacent to the central through-hole and defining a central, circular head fixing opening (84).

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwada in view of Fujikawa.

Kuwada teaches one diffusion plate disposed within the head body to disperse the gas toward the wafer surface rather than a plurality as claimed. In supplementation, Fujikawa elaborates an embodiment wherein a plurality of diffusion plates (14) is stacked in layers within the showerhead body, thereby demonstrating the technique's suitability for gas dispersion (1, 45-60; Fig. 15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate additional diffusion plates within the head body of Kuwada to achieve the predictable result of enhancing gas mixing and distribution.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Ford whose telephone number is 571-270-1880. The examiner can normally be reached on M-F, 8:30-5:00 EDT. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland, can be reached at 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/N. K. F./

Examiner, Art Unit 1792

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/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792